MARINE ENGINEERING AND NAVAL ARCHITECTURE AT CORNELL.

IN October, 1890, the Board of Trustees of Cornell University authorized the director of Sibley College, Dr. R. H. Thurston, to organize a graduate school of marine engineering and naval architecture as a department of that college. Owing to the difficulty of obtaining suitable officers, no appointments were made until September, 1891, when Professor W. F. Durand, late of the Engineer Corps of the United States Navy, was appointed principal. This appointment was followed some months later by that of Professor G. R. McDermott, late with J. & G. Thompson, Clydebank, as assistant in naval architecture.

The object of the school is to provide courses, both practical and theoretical, where any one possessed of a good general engineering knowledge may learn of the applications of engineering and science to the design, building, powering, and propulsion of vessels of all types. The courses as at present offered cover two years, and are designed to thoroughly ground the student in the fundamental principles of the science, and to give him a large amount of practical application by the study and analysis of existing designs, and the subsequent preparation of designs of an original character.

The present year is considered as formative, but regular courses are given in marine engineering, naval architecture, and shipbuilding, the work being taken by from twelve to fifteen students. During the coming spring and summer Professor Durand will visit the schools of similar kind in Europe, studying their organization, methods, equipment, and objects, in order that the school may have the advantage, as far as the differing conditions will admit, of the results of experience in these older schools.

The work at the university may be supplemented by an annual excursion or inspection tour of from ten days to two weeks, in which the leading ship-yards and marine-engine shops of the Atlantic coast are visited, in company with one of the teachers. By means of these visits the student is brought into immediate contact with the actual fulfilment of the various problems which he has been studying from lecture, text book, and drawing-board. The practical methods of work are examined, notes and sketches are taken, and a written report on the trip is prepared and submitted.

In the arrangement of the subjects and in the division of time for the professional work, it is intended to give sufficient time to theory and general principles to furnish a good general grasp of the subject, such theoretical work being always illustrated and impressed by applications to practice, and supplemented by a large amount of work more purely practical in character.

The objects to be kept in view are considered as two-fold. First, the power to deal intelligently with the actual problems of ship and power design and construction as they present themselves in practice. Second, the fostering and development of that originality of thought which, under proper control and with other gifts, may form the suggestiveness of mind characteristic of those qualified to aid in the continual advancement of engineering and scientific work.

Of special equipment the school is provided with the following: Several hundred photographs and drawings, both general and detail, illustrative of marine construction of all forms. A number of half-breadth models of ships, including some of the more noted Atlantic liners. A complete set of Copenhagen ship curves, with battens, special drawing-boards, and all appliances for ship drawing. An Amsler integrator of the latest type Large additions are being made to the books and other professional literature already in the library, and no pains will be spared to make the library equipment as complete as possible in every form of literature relating to marine engineering and naval architecture. The equipment of the general mechanical laboratory, unexcelled in extent by that of any laboratory in the world, is also available for use by the student, and every related department of the university will offer its best facilities for such work as students in the School of Marine Engineering and Naval Architecture may find desirable.

NOTES AND NEWS.

PROFESSOR CRAGIN, in charge of the Department of Geology and Palæontology in Colorado College, Colorado Springs, is now absent on leave in the service of the Geological Survey of Texas, under State Geologist Dumble. His work will be largely palæontological. His headquarters and address are Austin, Texas.

— The committee on the memorial to be erected to the memory of the late G. A. Hirn, the eminent engineer and physicist, composed of selected representative men in his department of research throughout the world, has just issued, through its president, M. G. Kern, a circular inviting contributions from all who desire to aid in this work, and who appreciate the contributions made to science and to the arts by that great man. M. Hirn died at Colmar, Alsace, January, 1890, and this committee was very soon afterward formed for this especial purpose. Its plan is to erect at Colmar a monument, to be designed by his friend, M. Bartholdi, a statue in bronze, the pedestal to be inscribed with the simple words:

G. A. HIRN,
1815–1890.

It is expected that the monument will be erected mainly by contributions from the citizens of his native town; but the voluntary contributions of friends all over the world will be gladly received as tokens of the respect and affection which the man and his work have earned for him. Such funds as may be given for this object may be sent directly to the treasurer, M. Georges Baer, Colmar, and to any member of the committee in this country. Professors Asaph Hall, L. S. Holden, W. B. Taylor, and Dr. Thurston will gladly take charge of them and forward with suitable acknowledgments to the donors.

— At the August meeting, in Washington, of the Society for the Promotion of Agricultural Science, a paper was presented on "Eastern and Western Weeds," by Byron D. Halsted, New Brunswick, N.J. His remarks were founded upon the reports of a large number of botanists and crop growers throughout the United States, received in response to letters sent to them or questions asked through the public press. Having lived for four years in Iowa, and being now a resident of New Jersey, the weeds of these two States have received personal consideration, and therefore these widely separated States will furnish a basis for a comparison of the weeds of the East and the West, not being unmindful of the fact that Iowa represents the central part of our continent, while the West, strictly speaking, reaches beyond the Sierras. The New Jersey list can be made up from the one for Iowa by omitting seventy-five of the native prairie plants, mostly perennials, and adding forty-three, a large percentage of which are annuals. The only single weed of the first rank stricken from the Iowa list in adapting it for New Jersey is a species of pig weed, but even this within the last year has been found within the latter State. On the other hand there are several first-class weeds that are added in the adoption of the western list to the East. Of such, for example, are: a pepper grass, the wild radish, two kinds of cocklebur, feverfew, wild onion, wild leek, nut-grass, Bermuda grass, and a kind of chess, or a total of ten of the worst weeds. That which is true of New Jersey and Iowa likewise holds good for the whole East compared with the whole West. The East is overrun with a larger number of the most aggressive weeds; weeds that assert their ability to resist the forces of the cultivator and plant their banners upon the tilled ground, likewise annual weeds that stock the soil with a multitude of seeds, ready to spring into life whenever an opportunity offers. Some species of weeds are found everywhere, from Maine to California, as Chenopodium album, Amarantus retroflexus, Xanthium Canadense, Plantago lanceolata, Capsella Bursa-pastoris, and Portulaca oleracea. There are others prominent on the Pacific Coast and not elsewhere, as the Hordeum murinum, Silybum Marianum, and Malva borealis. Likewise there are weeds peculiar to the Rocky Mountain region, as the Iva axillaris, Franseria tomentosa, while on the prairies, especially in Kansas and Nebraska, the following head the list: Cenchrus tribuloides, Asclepias Syriaca, Solanum rostratum, and Helianthus

annuus. In the middle prairie States it is mostly the members of the sunflower family, as the ragweeds and cockleburs, that prevail. Coming into the central States the list is led by Canada thistle, quackgrass, docks, daisy, chess, plantain, and purslane. If to this list we add wild carrot, onion, and parsnip, and the like old foreign enemies, we have the extensive catalogue of these plant pests that prey upon the lands of New England. Of the weeds of the South as compared with those of the North it has not been the purpose here to speak, nor of the migration of weeds.

— At a meeting of the Chemical Society of Washington, Feb. 11, W. H. Krug read a paper on "The Behavior of Sugar Solutions with Acetone." Acetone and water are miscible in all proportions at ordinary temperatures. If a mixture is prepared containing more than ten per cent acetone, and sugar added in small quantities dissolving after each addition, a point will be reached where the further addition of sugar causes a separation of acetone. We can continue adding sugar until the water is saturated. It will then still contain a small percentage of acetone. At 25° C. this is approximately 9.5 per cent. On account of the highly viscous nature of a saturated sugar solution it is impossible to determine this figure accurately. It is thus necessary to reverse the problem, determining the solubility of acetone in sugar solutions of varying strength. Sucrose is absolutely insoluble in pure acetone. The acetone used boiled at 57.5° C. The following method was used for determining the solubility of acetone in sugar solutions. Twenty-five grams of a sugar solution of known strength were rapidly weighed into a flask, a small thermometer inserted and the flask closed with a rubber stopper. The whole apparatus was then weighed. It was brought to the required temperature and acetone added in small quantities from a burette, the flask being stoppered and shaken before each addition. The flask and contents were carefully kept at the same temperature. As soon as the saturation point was reached the next drop of acetone produced a milkiness, which on standing resolved itself into minute drops of acetone. The flask was then weighed again, and the weight of acetone added determined in this manner. The results were very satisfactory. The solubility of acetone in sugar solutions decreases as we raise the temperature. The curves of solubility were determined for three temperatures, 20°, 25°, and 30° C. From 40 to 50 per cent sugar they are practically parallel, and from 50 per cent they approach each other. It seems probable that they meet at 75 per cent.

Table of Solubility.

One hundred grams sugar solution dissolve per cent acetone at —

Per Cent Sugar.	20° C.	25° C.	30° C.
40	96 44	92.76	89.84
45	71.92	68.81	65.72
50	50.83	48.13	45.85
55	35.78	33.81	32 54
60	25.17	24.18	23.35
65	18.33	17.68	17.09
70	13.22	12.82	12.53

— According to a report recently published in Germany, there were, in 1889, 5,260 workmen killed in accidents, and 35,392 seriously injured. These losses do not vary much from one year to another. *Nature* compares the figures with those of the killed and wounded at Gravelotte — one of the most murderous battles in this century — which were 4,449 and 20,977. The industries furnishing most accidents were as follows, in descending order: mines, railways, quarries, subterranean works, building, breweries. All industries are arranged in 64 corporations, and it is estimated that more than 4 500,000 of work-people are insured. Wounds and fractures are the most usual form of injury, and the duration of treatment tends to increase every year, by virtue of a law which makes an allowance when incapacity for work exceeds three weeks (this was based on the observation that fractures were generally healed in three weeks). Since this law was introduced the treatment of fractures has taken longer. There are always more accidents in winter than in summer, and on Mondays and Saturdays than on other days. Also, there are twice as many accidents from 9 A.M. to noon, and from 3 to 6 P.M., than from 6 to 9 A.M., and from noon to 3 P.M. Better light in summer, and fatigue towards the end of each half-day of six hours, are supposed to explain some of these variations.

— In the February number of *Nature Notes*, Mr. Robert Morley vouches for the accuracy of a story which seems to indicate the possibility of very tender feeling in monkeys. A friend of Mr. Morley's, a native of India, was sitting in his garden, when a loud chattering announced the arrival of a large party of monkeys, who forthwith proceeded to make a meal off his fruits. Fearing the loss of his entire crop, he fetched his fowling-piece, and, to frighten them away, fired it off, as he thought, over the heads of the chattering crew. They all fled away, but he noticed, left behind upon a bough, what looked like one fallen asleep with its head resting upon its arms. As it did not move, he sent a servant up the tree, who found that it was quite dead, having been shot through the heart. He had it fetched down and buried beneath the tree; and on the morrow he saw, sitting upon the little mound, the mate of the dead monkey. It remained there for several days bewailing its loss.

— The people of Vienna have been greatly alarmed by the outbreak of a new epidemic, which is believed by some to be connected with the influenza. It affects the intestines, its symptoms being fever and acute colic, with the ejection of blood. Its appearance seems to indicate the absorption of some poisonous matter. At first it was attributed to the drinking-water, but this view has been generally abandoned. A representative of a Vienna newspaper has taken the opinion of some of the Vienna physicians on the subject. Professor Nothnagel hesitated to pronounce any judgment on the illness, the facts not having been sufficiently studied. Professor Drasche thought it might be "nothing else than a distinct form of influenza," and was confident that it was not due to the drinking-water. Professor Oser was also sure that the drinking-water had nothing to do with the disease, and "did not consider that there was any indisputable evidence of its connection with influenza." Dr. Bettelheim seemed to think that there was something in common between influenza and the new malady called "catarrh of the intestines." He based his opinion on the fact that from the day when the latter made its appearance in an epidemic form cases of ordinary influenza had begun to decrease. He looked upon them both as being of an infectious nature. A chemical analyst, Dr. Jolles, said it would require three weeks to make a bacteriological inquiry into the character of the illness. A chemical analysis of the drinking-water, says *Nature*, showed it to be of normal purity.

— *Nature* prints some notes by Mr. J. J. Walker, R N., on ants' nest beetles at Gibraltar and Tangier, with especial reference to the Hisperidæ. The search for ants' nest Hister is a somewhat troublesome employment, as only about two or three per cent of the ants' nests contain the beetle. Mr Walker, however, thinks "it is a pretty sight, and one which compensates for a great deal of strain to the eyes, as well as to the back, to see a *Sternocœlis* or *Eretmotus* lying motionless among the hurrying crowd of ants and then, suddenly developing an amount of leg quite surprising in so small a creature, marching off daintily on the tips of its toes (or rather tarsi) with a ludicrous resemblance, in gait and appearance, to a tiny crab." The comparatively weak mandibles of the ants are ineffective against the hard armor and tightly-packed limbs of the beetles, which devour the helpless brood with impunity. Mr. Walker has more than once taken *S. acutangulus* with a half-eaten larva in his jaws, and they are usually to be found clinging to the masses of larvæ where these lie thickest. On the other hand, he once (but once only) saw an ant take up a *S. arachnoides* in its mandibles and carry it off into a lower gallery of the nest; but this may have been done under the influence of alarm, the frightened ant seizing on the first object that came in its way.